



**Environmental Restoration  
RFCA Standard Operating Protocol  
for Routine Soil Remediation  
FY04 Notification #04-01  
IHSS Group 600-3, IHSS 600-120.1  
(Fiberglass Area North of Building 664)**



**December 2003  
ADMIN RECORD**

1/14

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Approval received from the Colorado Department of Public Health and Environment  
December 11, 2003.

Approval letter is contained in the Administrative Record.

**December 2003**

## TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
2.0 IHSS 600-120.1 .....	1
2.1 Potential Contaminants of Concern.....	4
2.2 Project Conditions .....	4
2.3 RFCA Subsurface Soil Risk Screen Evaluation.....	4
2.4 Remediation Plan .....	5
2.5 Stewardship Evaluation.....	5
2.5.1 Proximity to Other Contaminant Sources .....	6
2.5.2 Surface Water Protection.....	6
2.5.3 Monitoring.....	6
2.5.4 Stewardship Actions and Recommendations .....	7
2.6 Accelerated Action Remediation Goals .....	7
2.7 Treatment.....	8
2.8 Project-Specific Monitoring.....	8
2.9 Resource Conservation and Recovery Act (RCRA) Units and Intended Waste Disposition .....	8
2.10 Administrative Record Documents .....	8
2.11 Projected Schedule .....	9
3.0 PUBLIC PARTICIPATION.....	9
4.0 REFERENCES .....	9

## LIST OF TABLES

Table 1 Potential Remediation Areas for IHSS Group 600-3.....	1
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## LIST OF FIGURES

Figure 1 IHSS Group 600-3, IHSS 600-120.1 General Location .....	2
Figure 2 IHSS Group 600-3, IHSS 600-120.1 Existing Sample Data .....	3

## ACRONYMS

AL	action level
BM+2SD	background means plus two standard deviations
BMP	best management practice
D&D	decontamination and decommissioning
dpm/100 cm <sup>2</sup>	disintegrations per minute per 100 square centimeters
CDPHE	Colorado Department of Public Health and Environment
DOE	U. S. Department of Energy
EDDIE	Environmental Data Dynamic Information Exchange
EPA	Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
LLW	low level waste
MDL	method detection limit
µg/L	micrograms per liter
nCi/g	nanocuries per gram (nano = 10 <sup>-9</sup> )
ppm	parts per million
PAC	potential area of concern
pCi/g	picocuries per gram (pico = 10 <sup>-12</sup> )
PCOC	potential contaminant of concern
PDSR	Pre-Demolition Survey Report
POC	Point of Compliance
POE	Point of Evaluation
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
UBC	Under Building Contamination
VOC	volatile organic compound
WRW	wildlife refuge worker

## 1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) Fiscal Year (FY) 04 Notification addresses the remediation of Individual Hazardous Substance Sites (IHSSs) at the Rocky Flats Environmental Technology Site (RFETS) Industrial Area (IA). The purpose of this Notification is to invoke the ER RSOP for IHSS 600-120.1 Fiberglass Area North of Building 664 in IHSS Group 600-3. This comprises an area under and around Building 668. There are no other Potential Areas of Concern (PACs) or Under Building Contamination (UBC) sites IHSS Group 600-3. Activities specified in the ER RSOP (DOE 2003a) are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

Soil with contaminant concentrations greater than the RFCA action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), and associated debris will be removed in accordance with RFCA (DOE et al. 1996, 2003) and the ER RSOP (DOE 2003a).

IHSS Group 600-3 is shown on Figure 1 and the proposed remediation sites covered under ER RSOP Notification #04-01 are listed in Table 1.

**Table 1**  
**Potential Remediation Areas for IHSS Group 600-3**

<b>IHSS Group</b>	<b>IHSS/PAC/UBC Site</b>	<b>PCOCs</b>	<b>Media</b>	<b>Estimated Remediation Volume</b>
600-3	IHSS 600-120.1, Fiberglass Area North of Building 664 (area under and around Building 668)	Radionuclides Metals VOCs SVOCs	Surface and subsurface soil	32 cubic yards

## 2.0 IHSS 600-120.1

Soil contamination at IHSS 600-120.1, based on previous sampling results, is depicted on Figure 2. Contamination is defined as an analyte concentration greater than the background means plus two standard deviations (BM+2SD).

## **2.1 Potential Contaminants of Concern**

Potential contaminants of concern (PCOCs) at IHSS 600-120.1 are listed in Table 1. The PCOCs were determined based on surface soil sampling, as shown on Figure 2, and process knowledge.

## **2.2 Project Conditions**

The following conditions are present within IHSS 600-120.1, the fiberglass area north of Building 664:

- IHSS Group 600-3 consists of an area beneath and around Building 668 where waste packing boxes were coated with fiberglass. Building 668 is a small wooden shed with deteriorating fiberglass panels as walls. Approximately 60 percent of Building 668 has walls, while 40 percent does not; the interior is visible through the openings. The floor consists of a single concrete slab.
- Fiberglass activities occurred in the area from 1972 to 1979. The fiberglass process may have resulted in spills of polyester resin, peroxide catalyst materials, and cleaning solvents, although no documentation of spills was indicated in the Historical Release Report (HRR) research (DOE 1992-2003).
- Recent Decontamination and Decommissioning (D&D) activities for the Pre-Demolition Survey Report (PDSR) at Building 668 found fixed plutonium-239/240 activities up to 187 disintegrations per minute per 100 square centimeters (dpm/100 cm<sup>2</sup>) along the western side (DOE 2003b). Because of the PDSR report of fixed plutonium contamination a surface soil sample was collected from the center of the western side of the 668 structure. In that sample gamma spectroscopy detected uranium-238 activity greater than BM+2SD, but less than the RFCA AL. No other radionuclide was detected above BM+2SD. The PDSR also reported a semivolatile organic compound (SVOC) analysis from a concrete core collected in the northwest corner of the slab with a total of 3.8 parts per million (ppm) hexachlorobenzene (Figure 2).

## **2.3 RFCA Subsurface Soil Risk Screen Evaluation**

An SSRS is performed when non-radionuclides and uranium are present in soil below 6 inches from the ground surface, when americium and plutonium are present below 3 feet from the ground surface, and for soil beneath below-grade structures. Current site conditions are evaluated to determine whether remediation is required according to the SSRS.

Subsurface soil data for IHSS Group 600-3 are not available. However, data from borehole P411989, approximately 15 feet west of IHSS 600-120.1, are available (Figure 2). Soil from the surface to 28 feet was analyzed for metals, volatile organic compounds (VOCs), and analytes potentially affecting water quality. The results from these analyses were all below background and RFCA ALs.

Because not much data are available at this time, the SSRS evaluation will be performed upon receipt of data from sampling characterization in accordance with the IA Sampling and Analysis Plan (SAP) (IASAP) Addendum #IA-04-05. The results will be documented in a data summary or closeout report.

## **2.4 Remediation Plan**

This RSOP Notification remediation plan for IHSS Group 600-3 includes the following objectives:

- The concrete pad for Building 668 will be removed. The pad will be decontaminated or disposed of as low level waste (LLW) at an appropriate facility based on waste characterization results. The pad will not be recycled on the site.
- Remove soil with non-radionuclide or uranium contaminant concentrations greater than the RFCA wildlife refuge worker (WRW) ALs to a depth of 6 inches. If soil contamination greater than the ALs extends below 6 inches in depth, perform the SSRS to evaluate the need for further accelerated action.
- Remove soil with plutonium-239/240 or americium-241 activities greater than the RFCA WRW ALs to a depth of three feet, or to less than 50 picocuries per gram (pCi/g), whichever comes first. If activities are greater than 3 nanocuries per gram (nCi/g) between 3 and 6 feet, characterize and remediate pursuant to RFCA Attachment 5 (DOE et al. 2003). If plutonium-239/240 or americium-241 is present at activities greater than the RFCA WRW AL but less than 3 nCi/g below 3 feet, conduct an SSRS.
- Consult with the regulatory agencies if contaminant concentrations are greater than the proposed ecological receptor ALs but lower than the WRW ALs.
- If contaminated soil is removed, collect confirmation soil samples in accordance with the IASAP (DOE 2001a).

It is anticipated that after remediation there may be areas with concentrations of metals, radionuclides, and organics greater than background means plus two standard deviations or method detection limits (MDLs) or reporting limits, but below RFCA ALs.

## **2.5 Stewardship Evaluation**

Based on the PCOCs (Table 1) and the ER RSOP (DOE 2003a), it is anticipated that all contamination above RFCA ALs will be remediated. Figure 2 shows the potential remediation area of the IHSS.

The following sections present the stewardship evaluation. If remediation is conducted, an additional stewardship evaluation will be performed during remediation using the consultative process and documented in a Closeout Report for IHSS Group 600-3. A new map of residual contamination will be generated after remediation.

### **2.5.1 Proximity to Other Contaminant Sources**

IHSS Group 600-3 is located in the RFETS IA close to other contaminant sources. IHSS Group 400-3, containing IHSS 400-136.2, is northwest of IHSS Group 600-3. IHSS Group 400-6, containing IHSS 400-157.2, is west. IHSS Group 400-10 contains two IHSSs, 600-120.2 and 600-161, and is southwest of IHSS Group 600-3. IHSS 600-161, located in IHSS Group 600-4, is east.

### **2.5.2 Surface Water Protection**

Surface water protection includes the following considerations:

#### ***Is there a pathway to surface water from potential erosion to streams and drainages?***

While unlikely, soil contaminants from IHSS Group 600-3 could migrate to surface water via erosion. IHSS Group 600-3 sits on the drainage divide between South Walnut Creek and Woman Creek (Figure 2). Surface drainage from the eastern, northern, and western sides of the IHSS is to the north and northeast, and surface runoff is conveyed to South Walnut Creek. Surface drainage derived from the southern side of IHSS Group 600-3 flows south toward Building 664 and ultimately enters Woman Creek.

#### ***Do characterization data indicate there are contaminants in surface soil?***

Existing soil data, as shown on Figure 2, generally indicate that contaminant concentrations are less than RFCA WRW and ecological receptors ALs. Beryllium from SS221393 was above background and the ecological receptor AL, but below the WRW AL. Additional sampling will be conducted in accordance with IASAP Addendum #IA-04-05 to further characterize IHSS Group 600-3. Results will be documented in a data summary or closeout report.

#### ***Do monitoring results from Points of Evaluation (POEs) or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?***

Recent water quality monitoring results from GS01, the nearest POC for Woman Creek, indicate no adverse surface water impacts from IHSSs within its drainage (DOE 2003c).

#### ***Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?***

IHSS Group 600-3 is not located in an area subject to erosion in accordance with Figure 1 of RFCA (DOE et al. 2003).

### **2.5.3 Monitoring**

Monitoring includes the following considerations:

#### ***Do monitoring results from Points of Evaluation (POEs) or Points of Compliance (POCs) indicate there are groundwater impacts from the area under consideration?***

One groundwater well, 84002, is just east of IHSS Group 600-3 (Figure 2). Tetrachloroethene, trichloroethene, and cis-1,2-dichloroethene are present in the well (DOE 2002). Tetrachloroethene concentrations were greater than the RFCA Tier II



groundwater AL (5 micrograms per liter ( $\mu\text{g/L}$ )), but less than the Tier I groundwater AL (500  $\mu\text{g/L}$ ). Trichloroethene and cis-1,2-dichloroethene were detected at concentrations less than the Tier II groundwater ALs.

***Can the impact be traced to a specific IHSS Group?***

Impacts cannot be traced specifically to IHSS Group 600-3. These contaminants are considered part of the IA Plume. A study that examines data for well 84002 and others, from the 2001 Annual RFCA Groundwater Monitoring Report (DOE 2002), shows that source areas for the tetrachloroethene, trichloroethene, and cis-1,2-dichloroethene present in the well do not coincide with IHSS Group 600-3.

***Are additional monitoring stations needed?***

Not applicable at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

***Can existing monitoring locations be deleted if additional remediation is conducted?***

No. There are two nearby wells. Of these, P411989 has been abandoned and well 84002 monitors contamination from areas other than IHSS Group 600-3.

## **2.5.4 Stewardship Actions and Recommendations**

The current stewardship actions and recommendations for IHSS Group 600-3 are as follows:

- Use best management practices (BMPs) to reduce erosion into surface water drainage.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
  - Fencing and signs to restrict access; and
  - Soil excavations controlled through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
  - Prohibitions on construction of buildings in the IA;
  - Restrictions on excavations or other soil disturbance; and
  - Prohibitions on groundwater pumping in the area of IHSS Group 600-3.

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

## **2.6 Accelerated Action Remediation Goals**

ER RSOP remedial action objectives (RAOs) include the following:

1. Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
3. Minimize the spread of contaminants during implementation of accelerated actions.

## **2.7 Treatment**

Not applicable.

## **2.8 Project-Specific Monitoring**

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations. Approximate locations of air samplers are shown on Figure 2.

## **2.9 Resource Conservation and Recovery Act (RCRA) Units and Intended Waste Disposition**

Not applicable.

## **2.10 Administrative Record Documents**

DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002, Final Annual RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Rocky Flats Environmental Technology Site, Type 2, Pre-Demolition Survey Report (PDSR), Building 668 Closure Project, Version 1, October.

DOE, 2003, Automated Surface Water Monitoring Second Quarter FY03 (Jan.-March 2003), Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

### **2.11 Projected Schedule**

Remediation of IHSS Groups 600-3 is expected to begin in the first quarter of FY04.

## **3.0 PUBLIC PARTICIPATION**

ER RSOP Notification #04-01 activities were discussed at the November 2003 ER/D&D Status Meeting. This Notification was provided to the local governments. It is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at [www.rfets.gov](http://www.rfets.gov).

## **4.0 REFERENCES**

DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002, Final Annual RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Rocky Flats Environmental Technology Site, Type 2, Pre-Demolition Survey Report (PDSR), Building 668 Closure Project, Version 1, October.

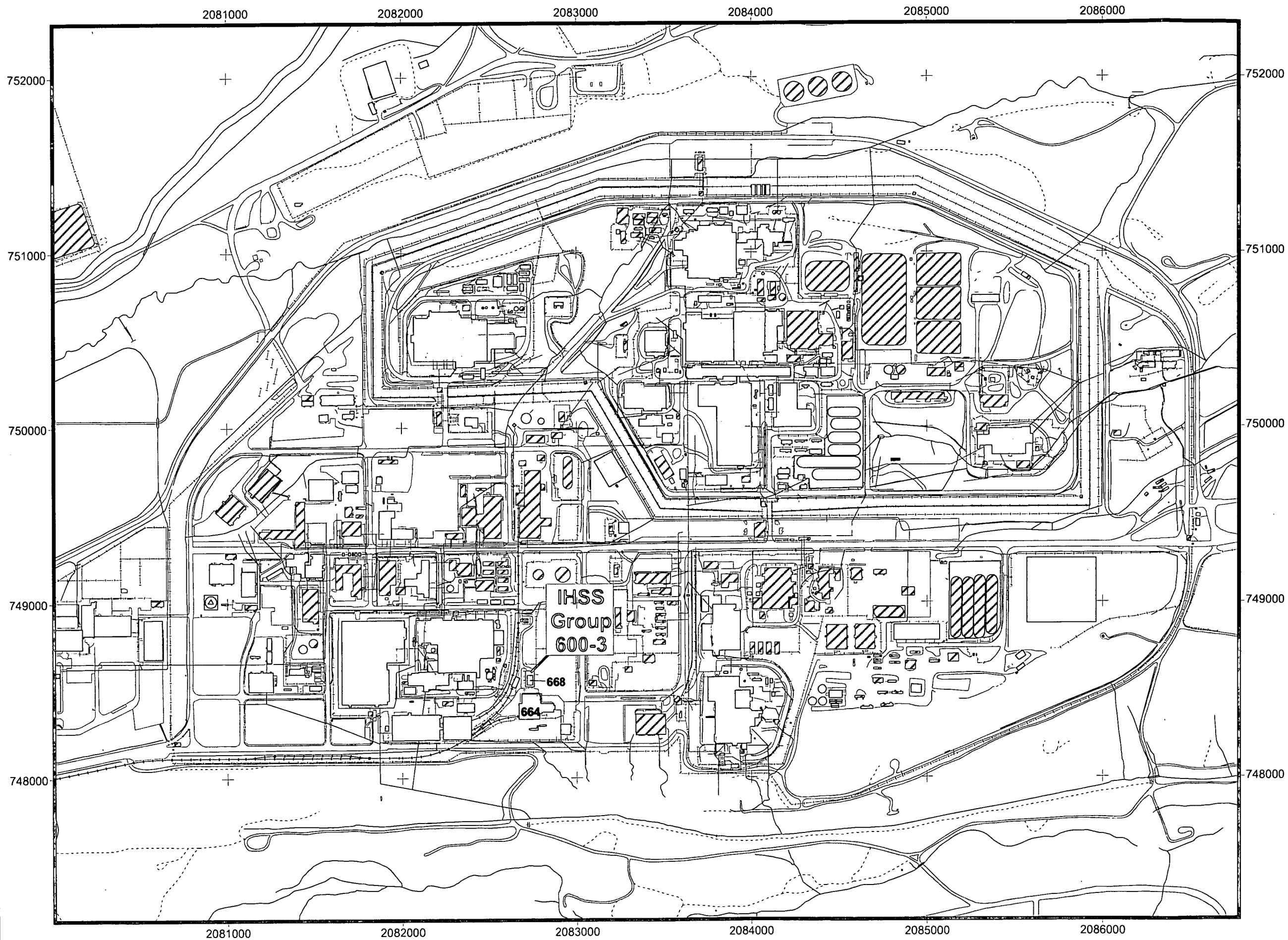
DOE, 2003c, Automated Surface Water Monitoring Second Quarter FY03 (Jan.-March 2003), Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S.











Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

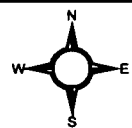
**Figure 1**  
**IHSS Group 600-3**  
**IHSS 600-120.1**  
**General Location**



**KEY**

-  IHSS Group 600-3
-  Demolished building
-  Standing building
-  Paved road
-  Dirt road
-  Trail
-  Railroad
-  Fence
-  Sewer
-  Surface drainage

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200 0 200 400 600 800 Feet

Scale = 1:6500

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared for:



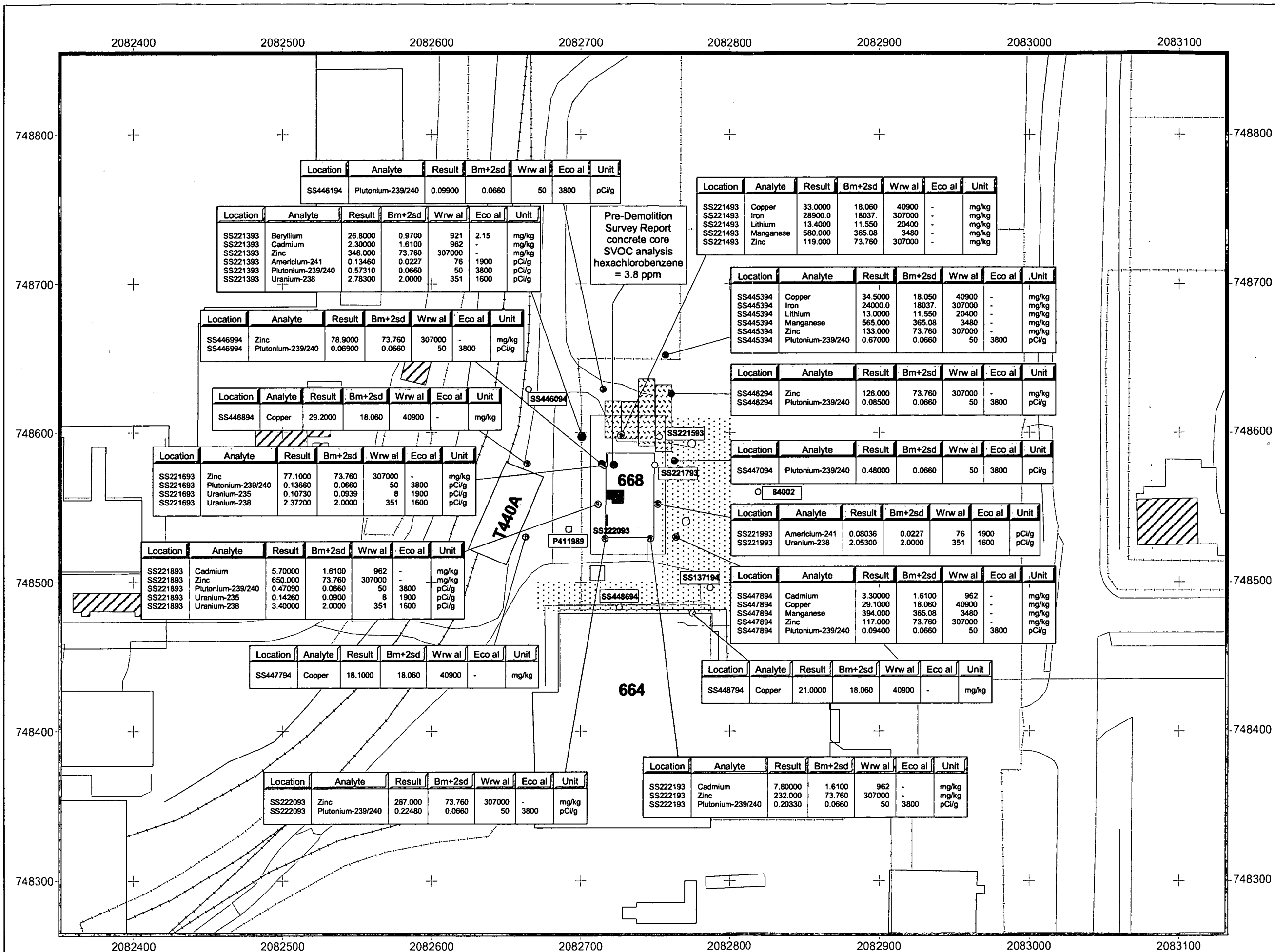
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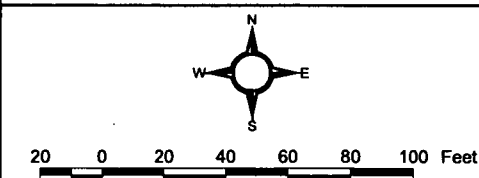


**Figure 2**  
**IHSS Group 600-3**  
**IHSS 600-120.1**  
**Existing Sample Data**

**KEY**

- Surface Soil Sample Locations Less Than Background
- Subsurface Soil Sample Location Less Than Background
- Surface Soil Sample Location Greater Than Background and Less Than Wildlife Refuge Worker or Ecological Action Levels
- Surface Soil Sample Location Greater Than Background and Greater Than Ecological Receptor Action Level, but Less than Wildlife Refuge Worker Action Level
- High volume air sampler
- IHSS Group 600-3
- Fixed surface plutonium contamination on slab
- ▨ Building demolished
- Building standing
- Asphalt
- ▨ Conex
- ~ Paved Roads
- ~ Dirt Roads
- ~ Fences
- ~ Railroads
- ~ Sewers
- ~ Streams

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Scale = 1:750

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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